MTH400 User Manual

Wideband Wireless

Professional Handheld

Transmitter

SN: _____

Rev.04 (rif. FW 1.10.0I)

Date: 08 July 2014

INTRODUCTION

MTH400 is a professional radio microphone especially designed for broadcast/high quality applications.

MTH400 is composed by 3 detachable parts:

- ***MIC Head*** (available with cardioid/hypercardiod polar pattern).
- ***MIC Body*** (the below part can be open to access "Display & Setup controls" area (fig.1) and on the back the "Batteries holder & Infrared" area (fig. 2).
- ***MIC Antenna***, made with fibreglass reinforced housing and with a "Wireless power switch" (fig. 3). "MIC Antenna" is fastened to body with 2 anvils and a micro-connector.

Open MIC Body:
Unscrew & slide down cover, toacces internal setup controls and batteries holder & infrared.

Wireless power switch with programmable LED indication (green/red).

***Exchange head**:*
unscrew it counter-clockwise

Fig. 3 Wireless power switch

Fig. 1 Display & Setup controls

Fig. 2 Batteries holder and infrared

SAFETY INSTRUCTION

- Read this safety instruction and the manual first
- Follow all instructions and information.
- Do not lose this manual.
- Do not use this apparatus under the rain or near the water.
- Do not install the apparatus near heaters or in hot environments, do not use outside the operating temperature range.
- Do not open the apparatus, only qualified service technician are enabled to operate on it. The apparatus needs servicing when it is not properly working or is damaged by liquids, moisture or other objects are fallen in the apparatus.
- Use only accessories or replacement parts authorized or specified by the manufacturer.
- Clean the apparatus only with dry cloths, do not use liquids.
- Report the serial number and the purchasing date in front of the manual. It is needed to have proper replacement parts or accessories from the manufacturer.
- When replacement parts are needed, use only replacement parts authorized from the manufacturer. Substitution with not authorized parts could result in electric shock, hazards or fire.
- Keep attention on all the labels with warnings or hazards on the apparatus.

LED INDICATION (POWER SWITCH)

Led indication with bicolor led (red & green) on wireless power switch (fig. 3):

- Wireless transmission status: green on/off
- Battery status: green steady, slowly blinking (< 25%), quickly blinking (<12%)
- Modulation peak (if activated): red
- PTT status: red if active

BATTERIES

MTH400 is working with 2 AA alkaline or NiMH batteries (select correct type on setup controls). Battery status can be checked on internal OLED display or looking to LED status on power switch (see LED INDICATION section).

Battery substitution:

- Open MIC body: unscrew counter-clockwise the below cover to access batteries holder;
- Take out below battery to release upper battery leverage;
- 2nd battery falls down and can be remove

Attention: always replace both the batteries

POWERING UP

Move the wireless power switch (fig. 3) in upper position (towards MIC body) to activate wireless transmission: a green LED lights up (blinking when battery is low!).

SETUP CONTROL

Open MIC Body to access the “display and controls” area (fig. 1):

A. Graphics Display (**OLED**)
B. Channel selection buttons (**ch**)
C. MIC gain setup buttons (**gain**)
D. 3 position selector (**up** / **down** / **click**)

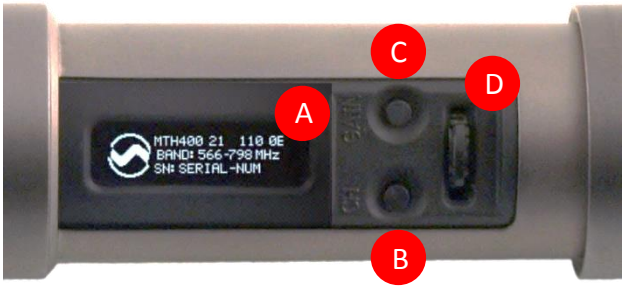


Fig. 4

OLED POWER UP (OLED IS IN OFF CONDITION)

Pushing down selector (**click**), the graphic display OLED turns on.

At the beginning a <BOOT> menu is displayed, then <STATUS> menu enters automatically. In order to keep the <BOOT> menu active, it is necessary to push and hold selector (click) for at least 2 sec.

<BOOT> menu

In the <BOOT> menu it is possible to found information regarding the Hardware and Firmware.

- Model (MTH400)
- Band (ex. 1)

1	470-640
2	566-798

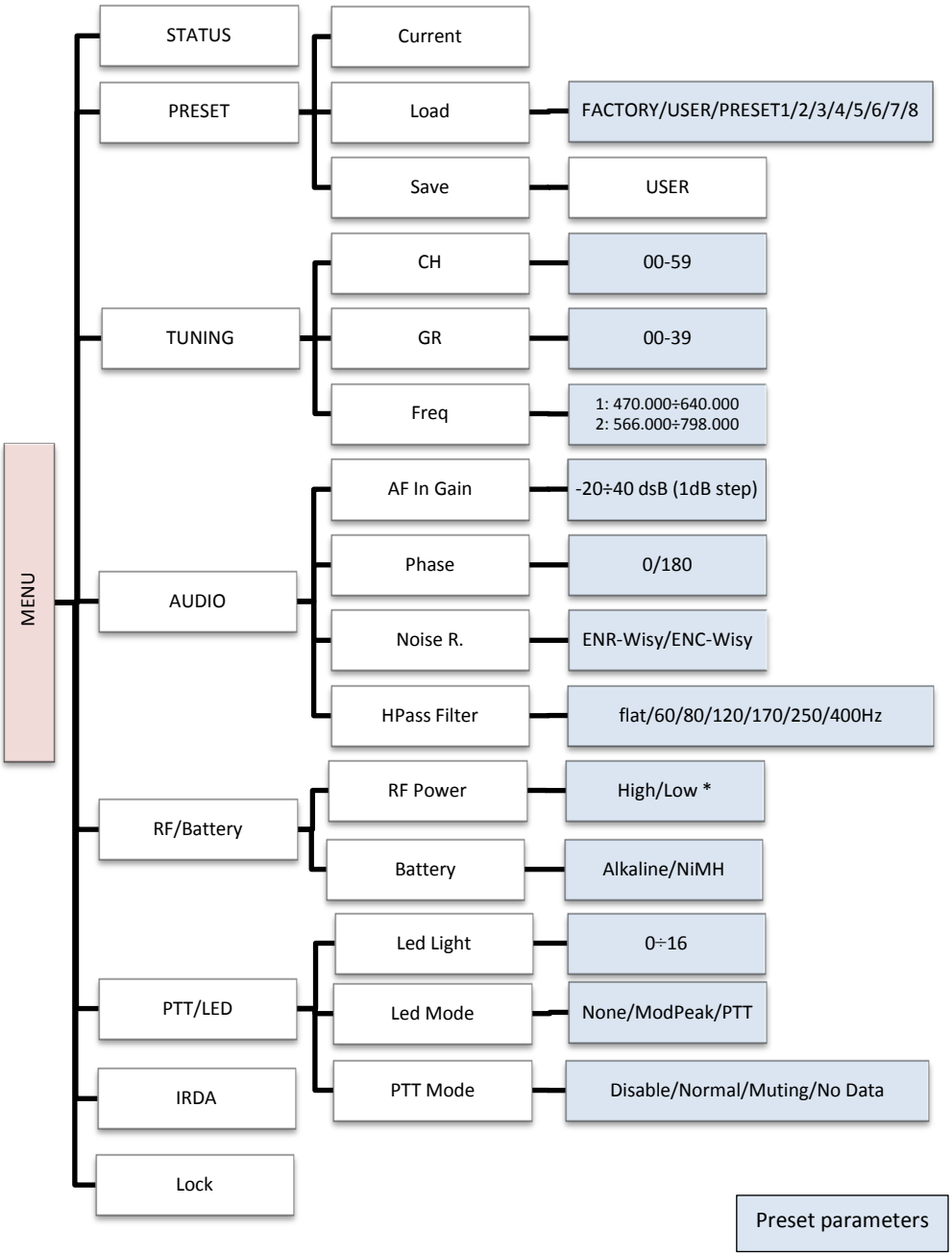
- Hardware revision (ex. 01)
- Firmware version (ex. 110 0E)
- Band in extended format (ex. 566-798)
- Serial number (ex. R3827484)

OLED POWER DOWN (OLED IS IN ON CONDITION)

Display turns off automatically after 15 sec, unless in <IRDA> menu or in <AUDIO> menu (with audio level < 5% from nominal).

DISPLAY MENU

Using **up/down** selector all menus can be accessed in sequence.



* Depending on the FW version, it can be: High or 50mW / Low or 10mW

Using <up/down> selector all menus can be accessed in sequence, push <click> to enter edit mode: (on the left side of the display appear "EDIT" and the selected parameter starts blinking):

<**up/down**> to setup field
<**click**> again to confirm changes and exit.
If no button is pressed, the device exits the EDIT mode and returns the parameter as it was previously set.

<STATUS> menu

This is the first menu displayed after power up.

	Major info are displayed: - Current channel/group (i.e. CH:00 GR:1) or Receiver's name (i.e. RECEIVER) if the microphone has already been synchronized with a receiver - Current frequency (i.e. 606 MHz) - Mic gain (i.e. -20dB) and high pass filter (i.e. Flat) - If in the top right there is "RF H" (or RF 50) or "RF L" (or RF 10), the transmission is active

<PRESET> menu

This menu can be entered by scrolling selector.

	This menu allows to load a PRESET configuration, modify the desired parameters (using the next menus) and save the new configuration to the USER configuration. When the user changes some parameters from the PRESET configuration (for less than frequency) a star appears on the top-right corner until a save command is executed.

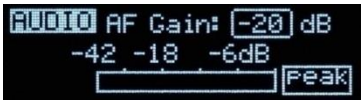
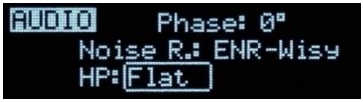
<TUNING> menu

This menu can be entered by scrolling selector or using *quick channel setup* button (**ch**).

	In this menu current channel/group and frequencies can be setup. *Sync* group is a quick self settable channel synchronized from receiver.

<AUDIO> menu

This menu can be entered by scrolling selector or using *quick gain setup* button (**gain**).

	The first AUDIO menu allows to set the **AF Gain** from -20dB to 40dB. To help proper audio gain setting, an audio bar is supplied (with peak hold bar) → **TRY TO SETUP TO HAVE A MAX PEAK HOLD BAR CLOSE TO -6dB**.
	The second <AUDIO> menu allows to set: - audio phase (0° or 180°) -Noise reduction (**ENR-Wisy** noise optimized or **ENC-Wisy** hi fidelity/voice optimized) - High Pass filter (Flat, 60, 80, 120, 170, 250, 400 Hz)

NOTE: To show the second menu screen it's necessary to scroll down with the selector.

<RF/BATTERY> menu

This menu can be entered by scrolling selector.

	RF power can be setup to High (or 50 mW ERP) or Low (or 10 mW ERP). *If it's selected "High" or "50mW", in the top right on the STATUS menu appear "RF H" or "RF50".** *If it's selected "Low" or "10mW", in the top right on the STATUS menu appear "RF L" or "RF10".** **Battery** type can be setup in Alkaline or NiMH.

*Depending on the FW version

<PTT/LED> menu

This menu can be entered by scrolling selector.

	Power switch green LED brightness can be setup → **Led light** (from 0 to 16). 4 different **PTT mode** can be selected: Disable, Normal, Muting, No Data. **Led Mode** setting define when the LED on the power switch (see Fig. 3) have to become RED: - None: never, - ModPeak: when audio get close to saturation) - PTT: when the PTT button is pushed

<IRDA> menu

This menu can be entered by scrolling selector.

	By this menu, MIC can be connected to IRDA for setup or firmware upgrades.

NOTE: while in this menu display is not automatically turned off.

<LOCK> menu

This menu can be entered by scrolling selector.

	Long pressing (2 sec.) selector button (**click**) it locks MTH400 in transmission mode. To unlock, long pressing (2 sec.) selector button again.

The following table sums up which parameters can be set and the related range settings.

MENU	PARAMETER	MEANING	RANGE SETTINGS
TUNING	CH	Channel	0 ÷ 59
	GR	Group	0 ÷ 39 + SYNC GROUP
	Freq	Frequency	It depends on the MTH400 Model: 1 470-640 2 566-798
AUDIO	AF Gain	Gain of the audio signal	-20dB ÷ 40dB step of 1 dB
	Phase	Audio signal phase	0° or 180°
	Noise R.	Noise reduction	ENR: Wisycom Extended-NR,noise optimized ENC: Wisycom Extended-NC,voice optimized
	HP	High Pass filter	Flat/60/80/120/170/250/400 Hz
RF/BATTERY	RF Power	RF Power	High (50 mW ERP) or Low (10 mW ERP)
	Battery	Battery type	Alkaline or NiMH
PTT/LED	Led Light	Power switch green brightness	0 ÷ 16
	PTT Mode	It defines how and what information the transmitter has to send	**Disable**: when the PTT button is pushed, nothing happen. (the transmitter sends AF+Tone squelch) **Normal**: when the PTT button is pushed, the transmitter send a different RF signal. According to the receiver configuration the audio can be enabled/disable on LINE (and/or COM). **Muting**: the transmitter doesn't send the audio. The voice is cut, it doesn't enter to the microphone **No Data**: the transmitter sends neither tone squelch nor battery data.
	Led Mode	It defines when the power switch led (see Fig. 3) has to become RED	None: never ModPeak: when audio get close to saturation PTT: when the PTT button is pushed

WISYCOM IR PROGRAMMER (VER. 1.3.1.1 AND ABOVE)

Wisycom IR Programmer allows to read, modify and update the MTH400 device configuration.

It is necessary to

- install Wisycom IR Programmer (version 1.3.1.1 or above)
  WARNING: If it is the first installation and Wisycom USB driver has not already installed in the PC, install the USB driver (run *C:\Program Files (x86)\Wisycom\MTP&MTH Infrared Programmer (TX)\Drivers\ DriverInstaller.exe*)
- connected the programmer PK300 or the receiver MRK950/MRK960 to the PC thru **USB connection**
- run the program
- enable the IRDA communication on the transmitter (see IRDA menu)

NOTE: Wisycom IR Programmer doesn't work whit MRK950/MRK960 if it is connected to the PC using an ethernet cable.

The Wisycom IR Programmer's window is divided in 4 parts (see Fig. 5):

1 **Interface** and **Device** panel contains all the major information of the connected **d**evice

2 **Current Settings** panel shows the current configuration. Thanks the PRESET panel, a previous saved configuration can be chosen and loaded like current setting.

3 **Tuning Frequencies** panel allows to handle Groups, Channels and Frequencies

4 **Presets** panel allows to read, change and save different configurations

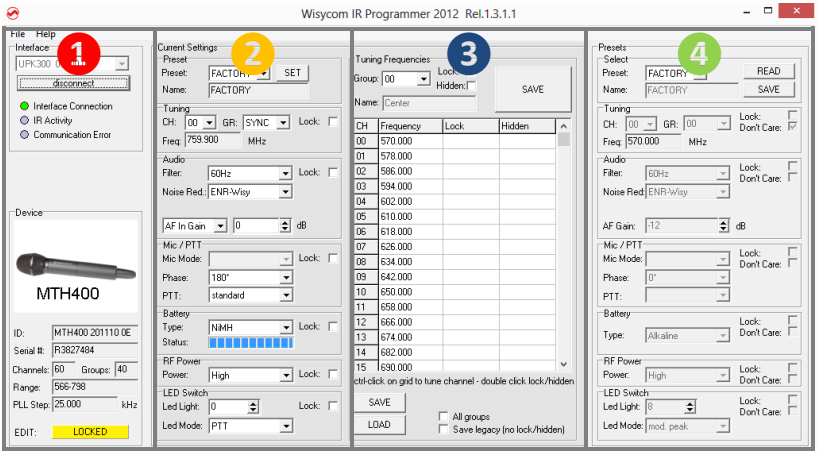


Figure 5: Wisycom IR Programmer's window

10 different configurations are available:

- FACTORY configuration is a locked configuration: no parameter can be changed.
- USER configuration is the only configuration that can be saved using the OLED display (see <PRESET> menu). Note: It is not possible to change the name of this configuration.
- Other 8 configurations where the user can change both the name and the values of all parameters.

INTERFACE AND DEVICE PANEL

At the beginning, the program checks which IR devices are detected and they appears on the **Interface** panel.

The user has to select the device and push <connect> button in order to open the communication with the IR device. A picture on the top in the Interface panel help the user in this selection showing the type of devices detected. During this process the "IR activity" led blinks to indicate that the program wait connection's answer from the IR device.

A successful connection is signaled with the "interface connection" green led, while a failed connection is signaled with the "communication error" led.

Once a supported device is found, the software automatically reads all the data related to the remote configuration, as well as the frequencies that are pre-programmed.

Firstly, in order to avoid unwanted operation, no parameters can be changes and the EDIT button, presents on the bottom of **Device** panel, is yellow and set to LOCKED state. Pushing the EDIT button, it becomes grey and sets to UNLOCKED state to indicate that the configurations can be modified.

CURRENT SETTINGS PANEL

In the Current Settings panel the user can

- with Preset panel → load one of the 10 available configurations
- with other panels → modify all the configuration's parameters (the same that are changeable in the OLED display). Each parameter can be locked clicking the related lock button, so the set value can not be changed next using the OLED display.

ATTENTION: All the modifies applied to the Current Settings panel are instantaneous: they are applied directly to the device and save in its memory but no saved in the preset configuration.

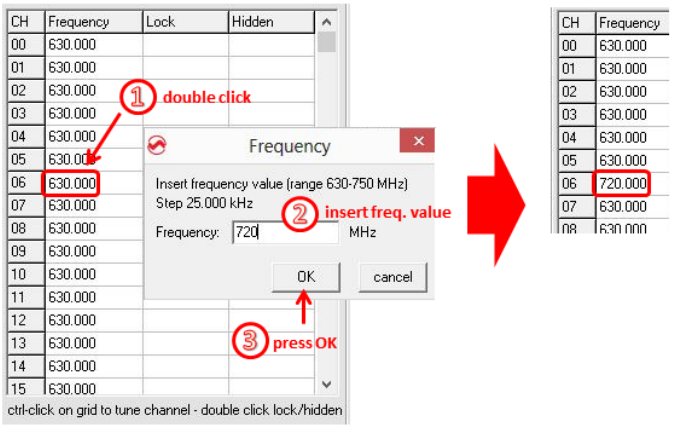
TUNING FREQUENCIES PANEL

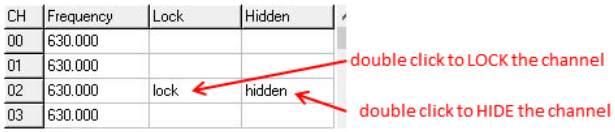
With the Tuning Frequencies panel the user can select a frequencies group (0÷39) and for each one execute the following operations:

- modify the Group's Name
- lock and/or hidden the group
- for each channel (0 ÷59) of the selected group: change the frequency value and the related status (locked/hidden) (in the center grid frequency)

The SAVE button, at the top of the panel, save the changes of the group selected (name group, lock/hidden group).

To change a frequency value for a specific channel: double click on the grid frequency panel (row=channel's number), insert the new frequency value and press OK button.

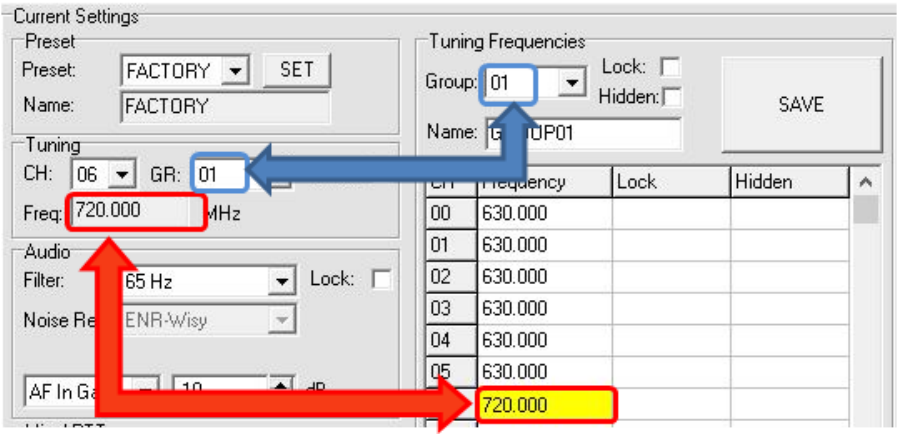




To lock/hide a specific channel, double click on the grid frequency panel.

NOTE: keeping pressed the CTRL button on the keyboard and clicking the wanted channel/group shown on the frequencies grid, the tuning process is executed. It is equivalent to configure the Tuning in the Current Settings panel but it is easier. The device is re-tuned immediately, so be sure that the RF power is turned off while changing frequencies with other RF systems in use around you!

If the currently tuned channel is on the same group that is listed on the grid, the background color of the related cell (channel) on the grid becomes yellow.



Using the LOAD/SAVE button, at the bottom of the panel, it is possible to **load/save** the frequencies for the selected group from/to a .wdf file. To save the frequencies of all the groups click to the related button above. The legacy option save the channels without the hidden/lock info.

PRESETS PANEL

The Preset panel allows to manage all the 10s available configurations.
For each configuration it is possible to set the name and all the parameters value except for FACTORY and USER configurations (see table below).

PRESETS:	NAME*	LOCK/DON'T CARE	PARAMETERS VALUE
FACTORY			
USER			√
OTHERS	√	√	√

√=change is allowed

* Be careful to write a meaningful name for the preset because the name will appear on the settings list of the device menu! Please, avoid empty names.

If a parameter is "locked", it cannot be modified by device menu (using OLED display), while if "don't care" propriety is active, when the user load the configuration, the parameter's value doesn't changed.

ATTENTION: Changes are applied only after a "save" action.
NOTE: *"a trick"* In case of the user have a locked parameter and he is in great need for modify it, he can save the configuration to USER configuration by OLED (see PRESET menu) and then load the USER configuration (in this way all the parameters have the lock propriety disable and the user can modify all the parameters).

FILE MENU

Using a file menu at the top left of the panel it is possible to **load/save all the configuration** values of the device to/from a .wcf file (Wisycom Configuration File).

Save a .wcf file

With an infrared device correctly connected, select File->Save User Configuration and select the destination file.

Load a .wcf file

To load a user configuration select File->Load User Configuration and select a previously saved data file; a form will be shown, where it's possible to select which data has to be restored and which skipped. This allow the user to load a particular configuration while keeping other data.

TECHNICAL SPECIFICATIONS

Switchable channels	2400 allocated by 40 groups of 60 channels (in specific frequency range), quickly selectable with dedicated buttons
Switching window	Up to 232 MHz, depending on band (see below code table)
Frequencies	Quartz PLL frequency synthesizer circuit (25 kHz step)
Frequency stability	▪ ± 2,5 ppm (in the rated temperature range)
Temperature range	-10 ÷ +55 °C
Max RF power	▪ 50 mW (ERP) when high power selected (note: In some countries high power can be disabled, for local norm!) ▪ 10 mW (ERP) when low power selected (to respect some local norm)
Spurious emissions	< 2 nW
Modulation	wideband FM, with 10 µs pre-emphasis
Nominal deviation	±40 kHz (Peak deviation = ±56 kHz)
Telemetry feature	MTH400 transmits also a digitally modulated sub-carrier, suitable for: ▪ *tone-squelch operating* ▪ *remote battery monitoring* ▪ *optional PTT (push to talk) operation*
AF input connection	Directly interchangeable microphone-heads
AF input level	-60 ÷ +0 dBu nominal, quickly settable by steps of 1 dB with dedicated buttons
Max. input level	+6 dBu
Max sound pressure	150 dB SPL (0,5% THD), with MCM301/MCM302/MCM303/MCM304/MCM305 condenser-heads
Noise-Reduction	ENR (Wisycom Extended-NR), with independent Attack- and Recovery-time, noise optimized ENC (Wisycom Extended-NC), with independent Attack- and Recovery-time, voice optimized & with reduced pre-emphasys
AF bandwidth	45 Hz ÷ 21 KHz (3dB) 55 Hz ÷ 20 KHz (1dB)
Distortion	< 0.3 % (0.15 % typ.)
Signal-to-noise ratio	typ. 115 dB $(A)_{rms}$ with 40kHz deviation typ. 121 dB $(A)_{rms}$ with 56kHz deviation
Led	Led indication with bicolor led (red & green) on wireless power switch: ▪ Wireless transmission status: *GREEN* on/off ▪ Modulation peek (if activated): *RED* ▪ Battery lifetime status: *GREEN* - steady (> 25%) - slowly blinking (< 25%) - quickly blinking (<12%) ▪ Ptt status: *RED* if active
Display	High contrast OLED (Organic light-emitting diode) display (96 x 36 pixels) 8 step battery lifetime indication: 7 bars (100%-87%-75%-63-50%-38%-25%) and "empty bar" quickly blinking (12% remaining)
Power supply	2 AA size cell (Alkaline, rechargeable NiMH)
Battery life (alkaline)	approx. 11 hours @ 50mW continuous working; up to 14 hours @ 10mW
Dimensions	⇒ body max. diameter 33 mm (without microphone-head) ⇒ total length 183 mm (without microphone-head)
Weight	Approx. 300g, including battery and MCM3xx (condenser) mic-head (approx. 260g batteries excluded)

Note: The above technical specifications refer to the MTH 400 "transmitter" section. The acoustic specs are relevant to the microphone-head used. The MTH 400 transmitter complies with ETS 300 422.

OPTION CODE MTH400-YZ-O:

▪ COLOR (Y)

B body color "matt black"

P body color titanium gray, (ceramic coating)

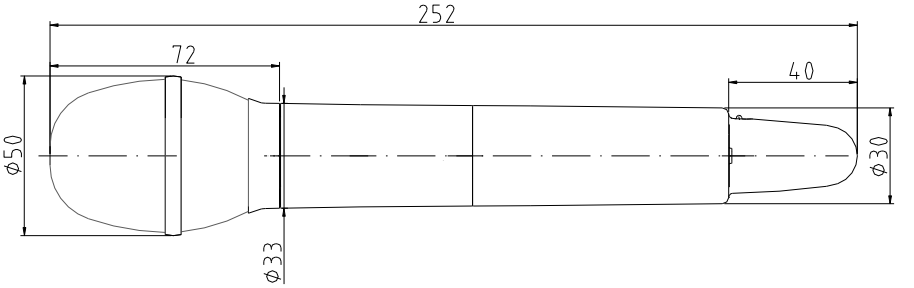
▪ FREQUENCY RANGE (-Z)

1 470-640 MHz

2 566-798 MHz

▪ OTHER OPTIONS (-O)

EXAMPLE: MTH400 B2 is color matt black, and 566-798 MHz frequency range



ITALY ONLY

Obblighi di informazione agli utilizzatori

Modello di informazioni agli utenti dei prodotti AEE di tipo "professionale"

ai sensi dell'art. 13 del Decreto Legislativo 25 luglio 2005, n. 151 "Attuazione delle Direttive 2002/95/CE, 2002/96/CE e 2003/108/CE, relative alla riduzione dell'uso di sostanze pericolose nelle apparecchiature elettriche ed elettroniche, nonché allo smaltimento dei rifiuti"

INFORMAZIONE AGLI UTENTI

Il simbolo del cassonetto barrato riportato sull'apparecchiatura o sulla sua confezione indica che il prodotto alla fine della propria vita utile deve essere raccolto separatamente dagli altri rifiuti.

La raccolta differenziata della presente apparecchiatura giunta a fine vita e' organizzata e gestita dal produttore. L'utente che vorrà disfarsi della presente apparecchiatura dovrà quindi contattare il produttore e seguire il sistema che questo ha adottato per consentire la raccolta separata dell'apparecchiatura giunta a fine vita.

L'adeguata raccolta differenziata per l'avvio successivo dell'apparecchiatura dismessa al riciclaggio, al trattamento e allo smaltimento ambientalmente compatibile contribuisce ad evitare possibili effetti negativi sull'ambiente e sulla salute e favorisce il reimpiego e/o riciclo dei materiali di cui è composta l'apparecchiatura.

Lo smaltimento abusivo del prodotto da parte del detentore comporta l'applicazione delle sanzioni amministrative previste dalla normativa vigente.

Le batterie fornite con questa apparecchiatura devono essere smaltite nel rispetto dell'ambiente, utilizzando gli appositi contenitori speciali messi a disposizione dal servizio pubblico di raccolta.

Iscrizione al Registro A.E.E. n. IT09100000006319

.

DECLARATION OF CONFORMITY

DICHIARAZIONE DI CONFORMITA'
DECLARATION OF CONFORMITY

Il sottoscritto, rappresentante il seguente costruttore
The undersigned, representative of the following manufacturer

WISYCOM S.r.l.
via Spin, 156 - 36060 Romano d'Ezzelino (VI) - Italy

DICHIARA che l'apparecchiatura descritta in appresso:
DECLARES that the product:

Descrizione *Description*	Handheld trasmitter
Modello *Model*	Mth400

è conforme alle disposizioni legislative che traspongono le seguenti direttive:
- **direttiva 2004/108 CE (Direttiva EMC)**
- **direttiva 2006/95 CE (Direttiva Bassa Tensione)**
- **direttiva 99/5 CEE (Direttiva Apparecchiature Radio)**

is in accordance with the following Directives:
- ***2004/108 EC Directive (EMC Directive)***
- ***2006/95 EC Directive (Low Voltage Directive)***
- ***99/5 EEC (Radio Equipment Directive)***

e che sono state applicate tutte le norme e/o specifiche tecniche di seguito indicate
and that all the following standards have been applied

EN 60065:2002 + A1:2006 + A11:2008 + A2:2010 + A12:2011

EN 301 489-1 V1.9.2

EN 301 489-9 V1.4.1

EN 300 422-2 V1.3.1

Luogo *Place*	Romano D'Ezzelino
Data *Date*	25 July 2012
Firma *Sign* (nome e funzione) *(name and title)*	Franco Maestrelli WISYCOM s.r.l. Franco Maestrelli Amministratore Unico

mth400-ce declaration.doc 1/1

WiSyCOM®

Wireless System Communications

Via Spin 156 • I-36060 Romano d'Ezzelino • Italy
Tel. +39 -0424 -382605 • Fax +39 - 0424 - 382733
www.wisycom.com • e-mail: sales@wisycom.com